Fermilab Steering Committee: Accelerator Facilities Group Update

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5/29/07

Strategy

- Look at facilities that could be relevant in three scenarios:
  - Scenario 1: ILC early start – Upon release of the EDR the funding agencies are prepared to proceed with construction at Fermilab.
  - Scenario 2: ILC delayed/cost/technical risk – Upon release of the EDR the funding agencies are not prepared to proceed with construction either because of unacceptable risk or the cost of construction. The ultimate construction of ILC remains the goals and an R&D program aimed at risk reduction in the range $80-$100M/year in the U.S is retained.
  - Scenario 3: ILC delayed/LHC results – Initial physics results from the LHC point to the need for an ILC energy reach beyond 1 TeV.

Meeting 1: 5/14

- Scenario 1 (ILC early start)
  - Assumptions:
    - 2012 construction start; 7 year construction period
    - 50% of $17B funding comes from US
    - 8000 FTE-years (US) required through construction
    - Fermilab piece is 800 FTE x 7 years (includes Davis-Bacon)
  - Systems tests (at Fermilab):
    - Single (or perhaps two) rf unit(s) test.
  - Industrialization:
    - Completed ~year after the start of construction, but not at the time of decision to construct.
  - Criteria for initiation of construction:
    - The GDE does not have a list of what has to be complete at the time of construction decision.
  - **Action Item: Create a strawman list of requirements for the ILC construction decision. (Tor, Tom, Sergei)**

Meeting 1: 5/14

- Scenario 2 (ILC Delayed) – Thanks to Dave
  - Four phase plan:
    - Phase 1: ILC EDR + srf infrastructure at Fermilab;
      SNuMI: 1.2 MW proton beam
    - Phase 2: ILC systems test;
      1 GeV linac + new 8 GeV booster: 1.7 MW
    - Phase 3: ILC CM industrialization $\Rightarrow$ 10 CM/year in industry
      HINS: 8 GeV linac + 8 GeV stripper/accumulator: 2.5 MW
    - Phase 4: ILC construction
  - Note: ILC decision to construct can come either at the end of Phase 2 or Phase 3.
  - Note: This approach aligns the requirements of HINS and ILC linacs
  - **Action Items:**
    Translate into a visual roadmap (Dave).
    Beam dynamics issues: MI space-charge, transition crossing in MI, beamloading, e-cloud. (Vladimir).

Meeting 2: Date TBD

- Action Item: Translate Dave's roadmap into a visual (Dave).
- Action Item: Start looking at beam dynamics issues: MI space-charge, transition crossing in MI, beamloading, e-cloud. (Vladimir).
- Action Item: Create a strawman list of requirements for the ILC construction decision. (Tor, Tom, Sergei)
- Review of synchrotron implementation of the Proton Driver (Steve)
- Discussion of our presentation at the June 12 meeting of the Steering Committee.

Facilities

- Facilities that we are or need to be looking at:
  - ILC systems test linac
  - 1 GeV linac + new Booster
  - 6 GeV linac for HINS and ILC
  - Damping ring in Tevatron tunnel
  - SuperB
  - 120 GeV stretcher ring based on Tevatron
  - 400-800 fast cycling fixed target ring in Tevatron tunnel
  - (High energy colliders are group 5)